



KINEMATICA AG

Dispersing and Mixing Technology

MANUAL



Instruction Manual for POLYTRON® System PT 1300 D



Voltage

90 – 260 V, 50/60 Hz

Make sure the power supply is correct and corresponds with the technical data plate on the instrument

This is a quality product of:



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1 INTRODUCTION

This chapter gives information on the structure of this document. It will assist you in making use of it and show how to find the required information quickly.

1.1 OPERATING INSTRUCTIONS

PLEASE READ THESE OPERATING INSTRUCTIONS BEFORE SWITCHING ON OR OPERATING THE EQUIPMENT. THEY DESCRIBE THE USE OF THE POLYTRON[®] PT 1300 D, ITS INSTALLATION AND MAINTENANCE AND THE APPROPRIATE REPLACEMENT PARTS AND ACCESSORIES. THEY WILL HELP YOU AVOID ERRONEOUS USE AND SUBSEQUENT DAMAGE. ALTHOUGH POLYTRON[®] UNITS ARE DESIGNED FOR EASE OF SERVICE, THIS DOES NOT RELEASE YOU FROM THE OBLIGATION TO INSPECT YOUR EQUIPMENT CAREFULLY AND TO CLEAN IT THOROUGHLY.

KINEMATICA AG is a specialist manufacturer of machines and equipment for dispersion and mixing technology.

An important objective of these operating instructions is to fully inform you, the user, about the correct and safe use of our equipment.

In order to achieve this, it is essential that you should carefully study chapter 2, "Safety", and follow the instructions in this book.



1.1.1 RANGE OF VALIDITY

The information in these operating instructions relates to the **POLYTRON®** identified as follows:

Manufacturer: **KINEMATICA AG**, CH-6014 Luzern
Brand name: **POLYTRON®**
Product name: **POLYTRON® PT 1300 D & POLYTRON® PT 1300 D RS232**

| Artikelnummer | Bezeichnung |
|---------------------------------------|---|
| 11010030 | PT 1300 D, MODBUS (with EU-Plug) |
| 11010031 | PT 1300 D, MODBUS (with CH-Plug) |
| 11010039 | PT 1300 D, MODBUS (with UK-Plug) |
| 11010032 | PT 1300 D, MODBUS (with EU-Plug, customer-specific) |
| Dispersing Aggregates (choice) | |
| 11030004 | PT-DA 03/2EC-E050 |
| 11030012 | PT-DA 05/2EC-E085 |
| 11030009 | PT-DA 05/2EC-E068 |
| 11030031 | PT-DA 07/2EC-E107 |
| 11030024 | PT-DA 07/2EC-E092 |
| 11030030 | PT-DA 07/2SYN-E082 |
| 11030062 | PT-DA 12/2EC-E123 |
| 11030042 | PT-DA 12/2EC-E157 |
| 11030266 | PT-DA 12/2MEC-E157 |
| 11030060 | PT-DA 12/2WEC-E157 |
| Stands | |
| 11040012 | ST-P01/200 – Hinge Stand |
| 11040011 | ST-P12/600 – Metal plate Stand specifically for the PT1300D |
| 11040013 | ST-P15/320 – Plate Stand |

ATTENTION:

The new Unit is not exchangeable with the old one. The new unit has a new designed supply module.



1.1.2 TARGET AUDIENCE

These operating instructions are intended for all authorised users of our machines/equipment. We distinguish different user roles, taking account of the different demands placed on the user by the activity to be carried out.

You will find the definitions of user roles with the demands on the user in chapter 2, "Safety". You can fulfil one or more of these roles, provided that you meet the corresponding demands.

1.2 ORGANISATIONAL MATTERS

If you are unable to find the answer to any question in the operating instructions, please contact the equipment manufacturer directly.

1.2.1 LOCATION OF THE OPERATING INSTRUCTIONS

The operating instructions can only be of use to you if you always have them at hand. They should therefore always be kept at the place where the equipment is used.

1.2.2 MANUFACTURER CONTACT ADDRESS

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Luzernerstrasse 147a

CH-6014 Lucerne

TEL: +41 41 259 65 65

FAX: +41 41 259 65 75

e-mail: laboratory@kinematica.ch



1.3 WARNING NOTICES

Please be aware of the meaning of the following warning signs:



**SAFETY INSTRUCTIONS MUST BE OBSERVED TO
ENSURE SAFE OPERATION.**



**THIS SYMBOL INDICATES HIGH VOLTAGE, WITH
RISK TO HEALTH AND ENVIRONMENT.**



**CAUTION!
BEWARE OF HOT SURFACE.**



**CAUTION!
DEVICE NOT DESIGNED FOR USE IN
EXPLOSION DANGER ENVIRONMENT.**

2 SAFETY

This chapter is directed at all users of KINEMATICA laboratory equipment. It includes information on safe and optimum use.



2.1 SUMMARY

Any incorrect use of the installed equipment can be dangerous. Inadequately trained users can cause material damage and personal injury. This chapter informs you about the safety concept and the requirements for safe and optimum use of the equipment.

All those authorised to operate, service and repair the equipment are required to study chapter 2, "Safety".

2.2 SAFETY CONCEPT

The safety concept sets down the entitlement to use the equipment and the responsibilities of the individual users.

The machines and equipment are designed and constructed according to the state of the art and the recognised safety rules.

2.2.1 INTENDED USE OF THE EQUIPMENT

The equipment is designed and constructed for the following use:

- Dispersion and homogenisation of pumpable fluid products in accordance with the technical specifications (see point 3.2) and compatibility with the materials coming into contact with the products.

If you use the equipment for any purpose other than those listed, the manufacturer cannot be held liable for any resulting damage.

2.2.2 IMPROPER USE

Any use other than the "intended use" without the written approval of the manufacturer or any operation outside the technical limits of use is improper use.

2.2.3 USER ROLES

To guarantee safety, we place requirements on the users of the equipment that must be met without fail. Only persons meeting the requirements are authorised to work with the equipment.

We describe all those who work with the equipment as users. Since the requirements of these users are very much dependent on their activity, we distinguish the following user roles.

**Contract partner:**

The manufacturer can impose legal obligations on the contract partner when the equipment is purchased. The contract partner is obliged to ensure that the equipment is properly used.

Operating company:

The operating company ensures that the equipment is properly used and authorises persons who are entitled to work with the equipment in any one of the defined user roles. They are under the obligation to instruct the users.

Note:

Contract partner and operating company can be the same person.

Service technician:

The service technician is an employee of the operating company and looks after the equipment in special operating mode(s). He is a specialist with mechanical, electrical and electronic professional training. The service technician undertakes commissioning, decommissioning service and repair of the equipment. He must be appropriately trained to be able to carry out the service work required.

Operator:

The operator turns the equipment on and off. In the event of an alarm signal he informs the service technician.



2.2.4 DANGER AREA

System/equipment

The system danger area includes the whole system/equipment including the connecting lead and controls.

Proximity danger area

This refers to all areas within a defined distance of the equipment.

User danger area

This danger area includes all persons working with the equipment.

2.2.5 AREAS OF RESPONSIBILITY

In order that the system/equipment can be used safely and without risk, the users in various roles bear the responsibility for particular danger areas.

Contract partner:

The contract partner bears the responsibility for the “proximity danger area”.

Operating company:

The operating company bears the responsibility for the “user danger area”. Only those users may be authorised to operate the system/equipment who fulfil all requirements of the user roles concerned. In doing so, attention must be paid to the following points:

- It is to be ensured that all users of the system/equipment have fully read and understood chapter 2, “Safety” and act accordingly in a safety-conscious manner.
- It is to be ensured that no unauthorised person carries out work with the system/equipment.
- It is to be ensured that users are informed of the possible risks and dangers connected with the system/equipment.
- It is to be ensured that those being trained or engaged in general training are under the permanent supervision of a trained and authorised person.

Service technician:

The service technician bears the responsibility for the “system/equipment danger area”. He ensures that the system/equipment is at all times free from technical faults, safe and functions correctly.






2.2.6 GENERAL SAFETY RULES

Observe the following general safety rules:

- follow these operating instructions,
- in addition, observe the legal obligations and requirements for accident prevention and environmental protection of the country in which you operate the equipment,
- do not make any modifications to the equipment without the written authorisation of the manufacturer,
- only original replacement parts may be used for repairs,
- before any service work on the equipment, it must be ensured that the electrical supply is switched off,
- after any service, maintenance or repair work has been carried out on the system/equipment, it must be given a test run by the service technician.
- depending on the place at which it is installed, circumstances may require that hearing protection is worn when remaining in the vicinity of the equipment for long periods.

2.3 RESIDUAL DANGERS

When the system/equipment is used in accordance with rules and regulations, residual dangers are minimal.





| Residual danger | Countermeasures |
|------------------------------------|---|
| Tripping over feed or return lines | These should be laid appropriately. |
| Breakage of glass containers | Wear protective clothing (goggles etc.).   |
| Spitting of the product | |
| Hearing loss due to loud noise. | According to the application ear protection must be used.  |
| Tilting of the device | Use stable, non-slip base |



IN EVERY CASE THE ELECTRICAL INSTALLATION HAS TO BE DONE BY TECHNICIAN!






2.4 WARNINGS

| | |
|--|---|
|  | <ul style="list-style-type: none">• Ensure that the rated voltage of the equipment matches the supply.• Before changing any dispersing aggregate, the line cord has to be plugged out• IT IS IMPORTANT THAT THE MAINS SUPPLY WHERE THE DEVICE IS PLUGGED IN COMPLIES WITH THE INFORMATION ON THE TYPE LABEL AND THE INTERNATIONAL STANDARDS FOR POWER SUPPLIES. IF NOT, SUCCESSFUL OPERATION CANNOT BE GUARANTEED |
|  | <ul style="list-style-type: none">• In the event that hazardous chemicals or materials that endanger health can influence the surroundings or use of the equipment, appropriate countermeasures must be taken. |
|  | <ul style="list-style-type: none">• At long term use the aggregate and the coupling may get hot – danger of skin burn. |
|  | <ul style="list-style-type: none">• The equipment may not be operated in explosive areas• It is not allowed to work with fluids, which are highly inflammable.• It is not allowed to mix materials which can cause strong exothermal reactions |

WARNINGS: TO BE CONTINUED ON NEXT PAGE



WARNINGS: CONTINUED

| | |
|---|---|
|  | <ul style="list-style-type: none"> • THE DEVICE MAY ONLY BE OPENED BY AUTHORISED KINEMATICA SERVICE STATIONS. • Ensure that enough free space is available at the backside of device, so that effective airflow and cooling is assured. Insufficient cooling may lead to a decrease of power output. • The device has to be placed in a manner that dirt or fluids cannot penetrate through the ventilation slots at backside of the drive. • Before changing any dispersing aggregate, the line cord has to be plugged out • POLYTRON® dispersion aggregates may not be operated dry – the lower sleeve bearing is cooled and lubricated by the medium being processed. Running dry will destroy the sleeve bearing. • The dispersing aggregates should be cleaned after every operation. • Never pull the coupling during operation – the aggregate could fall out of the coupling. • Never place the handheld horizontally or vertically with engaged aggregate. By non-use of the handheld always provided in the recess at the base station. Fluid is running in the motor and the life of the engine is greatly reduced. • The handheld of version 2 is not interchangeable with the new base station. • The handheld of version 3 is not interchangeable with the old base station. |
|  | <ul style="list-style-type: none"> • When the line cord is plugged, never touch the saw teeth of the aggregate – danger of injuries due to rotating shafts and blades |
|  | <p>KINEMATICA AG products comply with all the usual CE directives, carry the CE marking and are delivered with a corresponding declaration of conformity.</p> |



3 USE

POLYTRON® PT 1300 D handheld units are specially designed for the dispersing, homogenizing, suspending, emulsifying, decomposing and mixing of organic and inorganic sample material in small quantities.

3.1 DESCRIPTION

The **POLYTRON® PT 1300 D** consists of a microprocessor-controlled supply and control module and a high-performance low-voltage drive with a control and operating module including an LED display as well as a selection of three different homogenizing aggregates. **A hinged stand, a plate stand and a metal plate stand are also available as an option.**

For a ready-to-use system you need:

- **Control module (Handheld)**
- **Supply module (Base station)**
- **A dispersing aggregate**
- **A mains connection according to the type label**

3.2 POLYTRON®-AGGREGATES

| | Dispersing units (choice) | | | | |
|-------------------------|--|---------------------|---------------------|-----------------------|----------------------|
| | PT-DA 03/2EC-E50 | PT-DA 05/2EC-E68 | PT-DA 05/2EC-E85 | PT-DA 07/2SYN-E082 | PT-DA 07/2EC-E092 |
| Shaft length, mm | 50 | 68 | 85 | 82 | 92 |
| Stator/Rotor Ø, mm | 2.2/3.5 | 5.5/3 | 5.5/3 | 7.8/5 | 7.8/5 |
| Processing volume | approx. 0.05 – 2 ml | Ca. 0.1 – 3 ml | Ca. 0.1 – 3 ml | Ca. 0.5 – 10 ml | Ca. 0.5 – 10 ml |
| Notes | - | - | - | Synthetik | |
| Temperature | up to about 90 °C processing temperature | | | | |
| Pressure | not pressurised | | | | |
| Materials | stainless steel 1.4435 (316L) and PTFE compound | | | | |
| Cleaning | can be sterilised by all the usual methods, e.g. autoclave | | | | |
| Product requirements | The product to be dispersed must be pumpable and fluid and must not contain any solid particles that might destroy the attachment. | | | | |



| | Dispersing units (choice) | | | | |
|-------------------------|--|----------------------|----------------------|-----------------------|-----------------------|
| | PT-DA 07/2EC-E107 | PT-DA 12/2EC-E123 | PT-DA 12/2EC-E157 | PT-DA 12/2MEC-E157 | PT-DA 12/2WEC-E157 |
| Shaft length, mm | 107 | 123 | 123 | 123 | 123 |
| Stator/Rotor Ø, mm | 7.8/5 | 12/9 | 12/9 | 12/9 | 12/9 |
| Processing volume | Ca. 0.5 – 10 ml | Ca. 3 – 250 ml | Ca. 3 – 250 ml | Ca. 3 – 250 ml | Ca. 3 – 250 ml |
| Notes | - | - | - | Knife Rotor | W-Geometry |
| Temperature | up to about 90 °C processing temperature | | | | |
| Pressure | not pressurised | | | | |
| Materials | stainless steel 1.4435 (316L) and PTFE compound | | | | |
| Cleaning | can be sterilised by all the usual methods, e.g. autoclave | | | | |
| Product requirements | The product to be dispersed must be pumpable and fluid and must not contain any solid particles that might destroy the attachment. | | | | |

3.3 STAND ST-P01/200

POLYTRON® PT 1300 D handhelds can be supplemented with the joint stand ST-P01/200. The stand consists of the following components:

- Baseplate
- Pivotal articulated arm with the possibility of right, left, up, down movement
- Motor mounting with adjustable pitch up to approx. 15°

The stand should allow for a higher degree of flexibility at the workplace. The drive only needs to be plugged into the provided socket.



- **Make sure that the dive cable is attached to the cable holder on the arm so that it can not enter into the working area.**
- **Make sure that the mounting screw on the rear side of the stand has been tightened firmly so that the stand arm cannot move away during operation. (see the installation drawing enclosed)**

See under Appendix, Chapter 10



3.4 STAND ST-P12/600

POLYTRON® P T 1300 D handheld units can be used with the optional plate stand ST-P00/200. The stand consists of the following components:

- Baseplate
- Stand column with a maximum stroke of about 550mm
- Motor mounting with drive holder with the option of left, right, up and down movement

The stand should allow for a higher degree of flexibility at the workplace. The drive only needs to be plugged into the provided socket.

As an option, the following components are available:

- Cross sleeve complete for the attachment of a vessel holder
- Vessel holder
- An adjustment ring for precise positioning of the handset



Make sure that the mounting screw on the rear side of the stand has been tightened firmly so that the stand arm cannot move away during operation. (see the installation drawing enclosed)

See under Appendix, Chapter 10

3.5 STAND ST-P15/320

POLYTRON® PT 1300 D handheld units can be used with the optional plate stand ST-P15/320. The stand consists of the following components:

- Baseplate with stand
- Drive holder with the possibility of moving up and down
- Ability to provide the base station to the base plate

The stand should allow for a higher degree of flexibility at the workplace. The drive only needs to be plugged into the provided socket.



Make sure that the mounting screw on the rear side of the stand has been tightened firmly so that the stand arm cannot move away during operation. (see the installation drawing enclosed)

3.6 TECHNICAL SPECIFICATIONS

| POLYTRON® PT 1300 D | |
|-------------------------------------|--|
| motor type | Brushless DC-motor, electronically commuted |
| supply voltage | 90-260VAC |
| fuse | 2.5 A T (Passive) |
| supply frequency | 50/60 Hz |
| input power | 100 W |
| output power | 50 W |
| max. speed | 2'000 to ca. 30'000 rpm infinitely adjustable |
| direction of rotation | clockwise, seen from above |
| ambient temperature | 0 – 40°C |
| relative humidity | Max. rel. 95% |
| standards | EMV: certified by IEC/EN 61000-6-1 / 61000-6-3 / 61326-1 Safety: certified by IEC/EN 61010-2-51 & 61010-1 |
| protection type | IP 20 |
| max. period of continuous operation | 100% |
| Noise emission | < 70 dB (A) with full rotational speed with aggregate PT-DA12/2EC-E157 in H ₂ O |
| ON/OFF Switch | separate at control- and operating module |
| Current consumption | max. 0.5 A at 230 V max. 1 A at 100-120 V |
| Interface | Standard MODBUS, Optional RS 232 |
| weight (drive only) | control module 1033 g / operating module 568 g |



4 INSTALLATION

4.1 UNPACK

Open the dispatch box and check that the contents agrees with the delivery note.



CHECK ALL PARTS FOR POSSIBLE TRANSPORT DAMAGE. INFORM US OR YOUR DEALER IMMEDIATELY ABOUT ANY DISAGREEMENT OR FAULT. IF POSSIBLE SEND US DIGITAL PHOTOS BY EMAIL TO LABORATORY@KINEMATICA.CH

4.2 COUPLING/DECOUPLING OF THE HOMOGENIZING AGGREGATE

All **POLYTRON®** PT 1300 D handheld units are equipped with quick-coupling. Dispersing aggregates with diameters of 3, 5, 7 and 12 mm are available for the PT 1300 D drive unit. All aggregates are connected to the drive in exactly the same manner.

For assembly, while at a standstill, the coupling ring is pushed in the direction of the drive and the coupling part of the aggregate is pushed completely into that of the drive. The coupling ring snaps forwards again if the connection has been made properly (see the enclosed assembly sketch).



BEFORE STARTING WORK, MAKE SURE THAT THE AGGREGATE IS CONNECTED PROPERLY WITH THE DRIVE. AN INCORRECT CONNECTION CAN DAMAGE THE COUPLING PARTS OF THE DRIVE OR THE HOMOGENIZING VESSEL.



To remove the aggregate from the drive, push the retaining ring of the coupling upward and/or in the direction of the drive. At the same time, the aggregate is to be carefully pulled downward in the axial direction so that the homogenizing aggregate is not tilted in the coupling housing (see the enclosed assembly sketch).



WITH PUSHING UP OF THE COUPLING RING, THE AGGREGATE CAN UNINTENTIONALLY FALL OUT OF THE COUPLING. FOR THIS REASON, ALWAYS HOLD IT WITH ONE HAND.

THE SAW-TEETH OF THE STATOR ARE GROUND TO BE SHARP. THERE IS THE DANGER OF INJURY WITH IMPROPER HANDLING.

4.3 WORKING WITH THE PT 1300 D

- Connect your corresponding homogenising aggregate.
- Along with the drive unit, you also have the control in your hand. Firstly check for a proper connection of the supply and control module and the drive unit, then switch on the main switch on the supply and control module (green light).
- When you turn on, the display shows the selected firmware version for example C01



POLYTRON® -DISPERSING AGGREGATES MAY NOT BE USED IN THE DRY STATE – THE LOWER SLIDE BEARING ARE COOLED AND LUBRICATED BY THE LIQUID PHASE OF THE PROCESSES MEDIUM.

- Guide the connected aggregate into the medium to be processed. The optimal submersion depth of the aggregate is approx. 2/3 below the liquid surface and 1/3 above the vessel bottom. By submerging at an angle of approx. 15°, the degree of effectiveness can additionally be improved.



THE MAXIMUM SUBMERSION DEPTH IS BENEATH THE UPPER SCAVENGING HOLE OF THE STATOR TUBE.

- Switch on the control and operating module by using the ON/OFF switch. The unit now runs at the lowest rotational speed of 2000 rpm. Once the ON / OFF button is pressed the fan runs. This is required so that the motor is cooled in a continuous operation.



WHEN THE LINE CORD IS PLUGGED, NEVER TOUCH THE SAW TEETH OF THE AGGREGATE – DANGER OF INJURIES DUE TO ROTATING SHAFTS AND BLADES

- After done work the handheld is turned off with the ON / OFF button. The unit stops and the display shown OFF. The fan runs about 1 minute, then it stops automatically.



4.4 FUNCTIONAL DESCRIPTION OF THE KEY

| | |
|---------------|--|
| ON/OFF | <p>With the ON/OFF switch, turn on the control and operating module as soon as the main switch has been turned on at the supply and control module.</p> <p>The rotational speed will be 2'000 rpm if the PT 1300 D has meanwhile been switched off by means of the main switch, otherwise the control and operating module uses the last set rotational speed.</p> <p>With the ON/OFF switch, turn the control and operating module off again. The fan runs about 1 minute and then it stops automatically.</p> <p>If the control and operating module has not been used for a longer period of time, you should additionally switch off the main switch on the basis station.</p> |
| UP | <p>With the UP key, you can increase the rotational speed of the control and operating module in 100 rpm steps.</p> <p>The speed range is from 2'000 to 30'000 rpm.</p> <p>The rotational speed increases quicker when you press the switch.</p> |
| DOWN | <p>With the DOWN switch, you can decrease the rotational speed of the control and operating module in 100 rpm steps.</p> <p>The speed range is from 2'000 to 30'000 rpm.</p> <p>The rotational speed decreases quicker when you press the switch.</p> |
| MEMO | <p>By continually pressing the MEMO switch (>approx. 1 sec.), you can store the current rotational speed. Storage of the rotational speed is confirmed by flashing (3 times) of the display.</p> <p>A stored rotational speed can be loaded by shortly pressing the MEMO switch (<approx. 1 sec.)</p> |

The maximum rotational speed depends on the size of the dispersing aggregate, the type of product and viscosity. With deviations from the programmed rotational speed, e.g. by means of a strong rise in viscosity, the digital display flashes, which means that the preset rotational speed will not be reached any longer. With overloading of the drive, it is switched off by means of a thermal fuse.



4.5 ERROR MESSAGE

4.5.1 DRIVE OVERLOAD

The maximum rotational speed depends on the size of the dispersing aggregate, the type of product and viscosity. With deviations from the programmed rotational speed, e.g. by means of a strong rise in viscosity, the digital display will flash alternately between the speed and the message "OL", which means that the preset rotational speed will not be reached any longer. Once the device reaches the speed the message "OL" disappears. This message cannot be acknowledged.

4.5.2 THERMAL OVERLOAD PROTECTION

If the heat sink temperature of the motor rises above 80°C, the internally installed thermal indicator interrupts the output current circuit. On the display appears the message "HOT" and you can hear an acoustic signal. To acknowledge the fault, you have to set OFF the main switch. The operating module continues to function, the motor, however is no longer driven until the heat sink has cooled down to below 50°C. The unit must be restarted after that.

4.5.3 BLOCKING PROTECTION

Is the aggregate blocked for example to a solid material, the output current circuit interrupts. On the display appears the message "BLC" and you can hear an acoustic signal. To acknowledge the fault, you have to set OFF the main switch. Removing the solid from the aggregate. The unit must be restarted after that.

4.5.4 HALLSENSOR

The motor is equipped with 3 Hallsensors. The function of the hallsensors is to detect the speed of the motor. Is a hallsensor defective, on the display appears the message "HAL" and you can hear an acoustic signal. To acknowledge the fault, you have to set OFF the main switch. The unit must be restarted after that.

If the fault can not be resetted the unit must be send to KINEMATICA AG for repair.

4.5.5 INTERFACE

The hardware from the PT 1300 D is equipped by default with two Interfaces. USB interface with a standard type B connector and an RS232 interface with a 9 pin D-sub connector. The standard protocol is MODBUS. Interface could be controlled and regulated via PC. Profiles with rpm defaults could be fully automated.

More details about the MODBUS control you can find in the appendix 11.



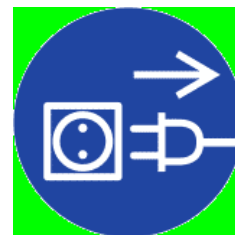
5 MAINTENANCE

Your POLYTRON® unit is designed for ease servicing. Nevertheless, it is essential to inspect your equipment carefully and to clean it thoroughly. Drawings of the separate components are to be found in the appendix.



**THE EQUIPMENT MUST BE DIS-
CONNECTED FROM THE ELECTRICAL
SUPPLY:**

- DURING ANY WORK ON THE EQUIPMENT, IN ORDER TO AVOID ANY PERSONAL INJURY OR OTHER DAMAGE
- WHEN CHANGING OR REMOVING THE DISPERSING AGGREGATE



5.1 MAINTENANCE OF THE SUPPLY AND CONTROL UNIT

The supply and control module does not require any special maintenance. There are also no parts that need or can be serviced or replaced by the operator. In the case of a malfunction, please contact KINEMATICA AG or your supplier.

5.2 MAINTENANCE OF THE CONTROL AND OPERATING MODULE

The control and operating module also does not require any special maintenance. There are no parts that need or can be serviced or replaced by the operator. In the case of a malfunction, please contact KINEMATICA AG or your supplier.

5.3 MAINTENANCE OF THE POLYTRON®-AGGREGATES

POLYTRON® - aggregates are precision instruments. Inspections and maintenance at regular intervals ensure years of proper functioning.

All **POLYTRON®** dispersing aggregates for PT 1300 D are EasyClean models. They can be autoclaved as complete units and do not have to be disassembled for this. If disassembly is necessary for special cleaning or to replace the slide bearings, proceed according to the following instructions. Only the slide bearing has to be controlled alternatively replaced from time to time.



5.4 DISASSEMBLY INSTRUCTIONS

| PT-DA 03/2EC-E050 | PT-DA 05/2EC-E068 – 085 | PT-DA 07/2EC-E82 – 107 | PT-DA 12/2EC-E123 – 157 |
|---|-------------------------|------------------------|--|
| With the universal tool supplied, carefully knock the rotor and attached shaft out in the direction of the coupling and then draw them out in the same direction. | | | With this attachment you receive an additional tool. Use one tool to hold the shaft and the other to turn the rotor anti-clockwise and withdraw it. You can then withdraw the shaft from its tube. |
| The lower sleeve bearing is slit and can be opened and pulled over the shaft. The upper bearing can be pulled off in the direction of the rotor. | | | Using the tool, the sleeve bearing can be pushed out in the direction of the coupling. |
| Replace defective parts. Bearings should only be replaced in pairs. | | | Replace defective parts. |
| Reassemble in the reverse order. | | | Use the shaft to press the sleeve bearing into the stator tube from the coupling side. Screw on the rotor and tighten gently. |
| After every disassembly, and especially after changing the bearings, a functional test should be carried out in water. | | | |

5.5 ASSEMBLY INSTRUCTIONS

After exchanging the slide bearings, the disassembly procedure is to be carried out in the reverse sequence.



THE SHAFT MUST BE PUSHED INTO THE STATOR TUBE UP TO THE STOPPER.

WITH THE PT-DA 12/2EC-E157, DO NOT INSTALL THE ROTOR ONTO THE SHAFT WITH FORCE.

ALSO SEE THE ENCLOSED SKETCHES IN THE APPENDIX



6 TROUBLE SHOOTING

| PROBLEM | REASON | CORRECTIVE MEASURES |
|--|---|--|
| Unusual noises | Damaged drive bearings | Change ball bearings. Trace & replace defective parts (shaft, bearings) |
| | Damaged aggregate ball bearings /sleeves | Change ball bearings / sleeves |
| | Rotor/stator interference | Trace and replace defective parts (shaft, bearings) |
| Drive stops | Inadequate ventilation | Check if ventilation slots are clear. Cool down the device & restart |
| | Thermal overload with the message "HO" | Check manner of use & ventilation. Cool down the device & restart. |
| | Error message "HAL" | Motor Hall sensors are defective. Contact authorised KINEMATICA service centre or directly to KINEMATICA AG |
| | Drive is blocked with error message "BLC" | Check the aggregate for solid particles which may be blocking the rotor, remove the particles, turn off the drive and restart operation. If the motor is defective contact authorised KINEMATICA service centre or directly to KINEMATICA AG |
| | Error message "SUP" | The internal Voltage is outer range. Contact authorised KINEMATICA service centre or directly to KINEMATICA AG |
| Vibrations | Bent shaft | Replace shaft |
| | Worn bearing(s) | Replace bearing(s) |
| | Defective coupling | Trace and replace defective parts |
| Drive does not start | Defective internal control | Contact authorised KINEMATICA service centre or directly to KINEMATICA AG |
| | Drive is blocked with error message "BLC" | Check the aggregate for solid particles which may be blocking the rotor, remove the particles, turn off the drive and restart operation. |
| Main switch is ON but system is not active | Power supply not connected | Check that supply cables are well plugged. |



7 GENERAL ACCESSORIES

A comprehensive overview of the various accessories and tools can be found in the current price list.

The homogenizing vessels specially developed by KINEMATICA are especially recommendable. Thanks to the extraordinarily good flow geometry, they help you to save time and can significantly improve the process.

8 GUARANTEE

KINEMATICA AG hereby guarantees malfunction-free operation of this unit that they have produced for a period of 12 months with regard to material and production flaws.

KINEMATICA AG hereby ensures repair of the unit free of charge and/or replacement of the sent-in defective parts free of charge, if an extensive inspection results in that this dealt with a production or material flaw.

The guarantee does not include parts, which are subject to normal wear, or when someone other than an employee of KINEMATICA AG or authorized representatives has carried out modifications to the unit or if the damage is caused by non-compliance with the operating instructions, carelessness, accident, improper use or an incorrect electrical voltage.

KINEMATICA AG reserves the right to carry out technical changes of the units, without having to do this with previously delivered units.

In the case of technical problems, with the need for spare parts or in the case that consultations is desired, please contact our regional appointed agent or use directly:

KINEMATICA AG

Luzernerstr. 147a
CH-6014 Lucerne
Switzerland

Tel. +41-41-259 65 65
Fax +41-41-259 65 75
e-mail: laboratory@kinematica.ch

POLYTRON® is a registered trademark of the KINEMATICA AG Luzern.



9 GUARANTEE



The symbol of the crossed refuse container signifies that the product in the European Union must be supplied to separate collection. Labeled products must not be disposed with household waste, rather must be left at a collection point for recycling electrical and electronic equipment. Recycling helps to reduce the consumption of raw materials and to protect the environment.

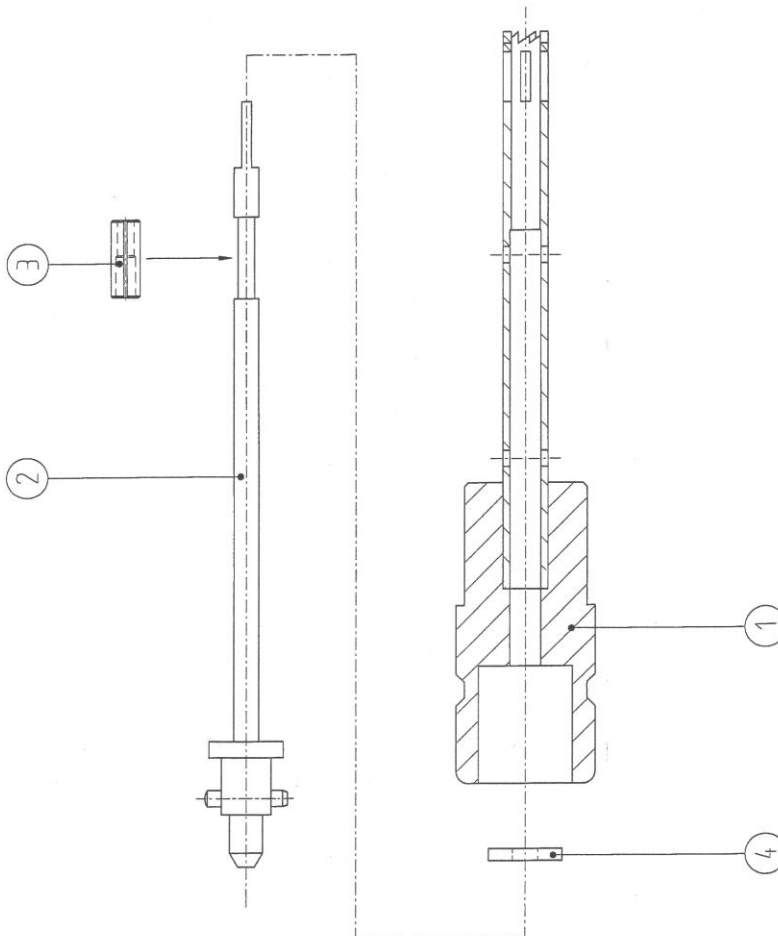
10 APPENDIX

10.1 LEGEND TO THE DRAWINGS OF PT-DA 05/2EC, 07/2EC, 12/2EC, 12/2 Z MEC

| Positionen | 1 | 2 | 3 | 4 |
|--|-------------|-------------|---------------|------------|
| PT-DA 05/2 EC.. Drawing-No. BA.004-001-3 | Stator tube | Drive shaft | Slide bearing | Slide disc |
| PT-DA 07/2 EC.. Drawing-No. BA.004-002-3 | | | | Slide disc |
| PT-DA 12/2 EC.. Drawing-No. BA.004-003-3 | | | | Rotor |
| PT-DA 12/2 .. EC.. Drawing-No. 1.012-0195-3 | | | | Rotor |



Diese Zeichnung ist unser geistiges Eigentum und darf ohne unsere Einwilligung weder kopiert, vervielfältigt, weitergegeben, noch zur Ausführung benutzt werden.
Allgemeine Toleranzen DIN 25440-10 | Alle Maße in mm

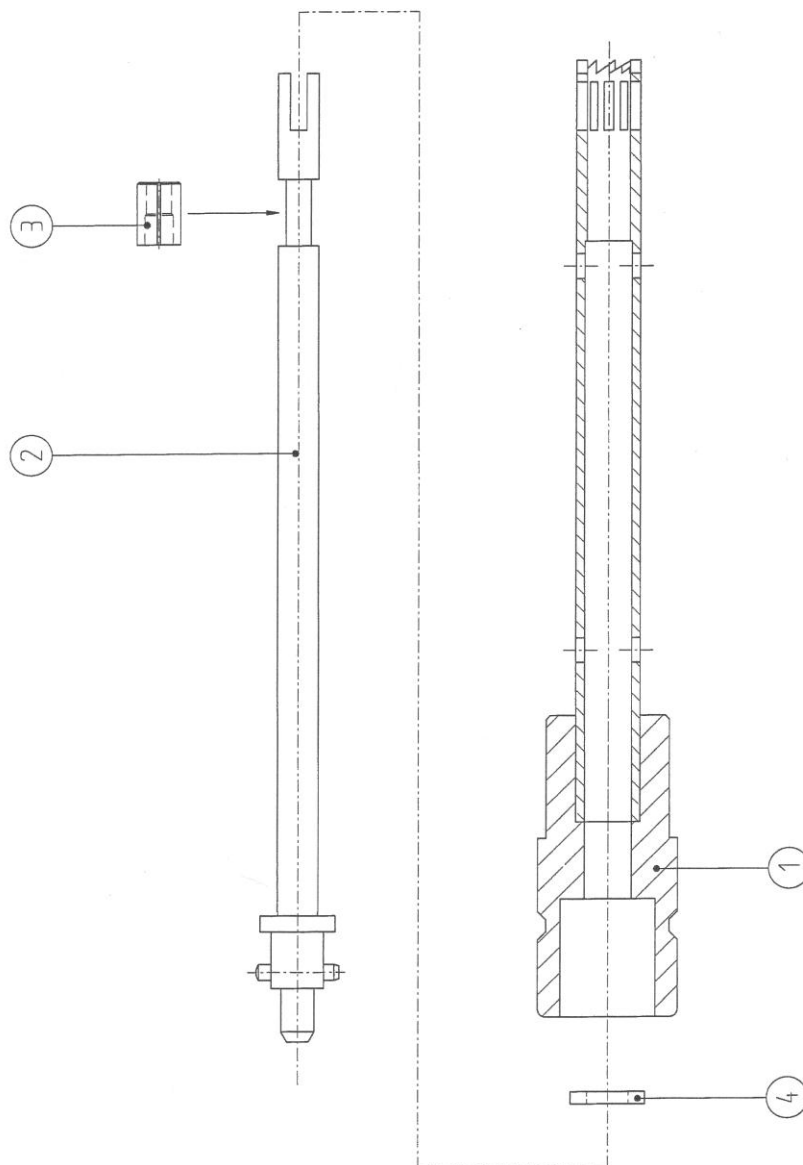



| Stk. | Gegenstand | Pos. | Material | Modell/Zust.-Nr. | Ident.-Nr. |
|--|------------|------|-----------------------|------------------|------------|
| PT-DA 1305/2EC | | | Microverfäli Daten | | |
| | | | | Erzst. für | |
| | | | Massstab 2:1 | Erzst. durch | 17/10/1997 |
| | | | | Gerechnet | 20/10/1997 |
| | | | | Geprüft | 20/10/1997 |
| | | | | Freigebe | 20/10/1997 |
| | | | PT 1300 | | |
| KINEMATICA AG | | | | | |
| Dagengrö- und Meschlechräk CH-6014 Ultau/Luzern Tel. 041/250 12 57 | | | | | |
| | | | BA.004-001-E | | |
| | | | Index | Anzahl Bl. | 1 |
| | | | | Blatt Nr. | 1 |



Diese Zeichnung ist unser geistiges Eigentum und darf ohne unsere Einwilligung weder kopiert, vervielfältigt, weitergegeben, noch zur Ausführung benutzt werden.

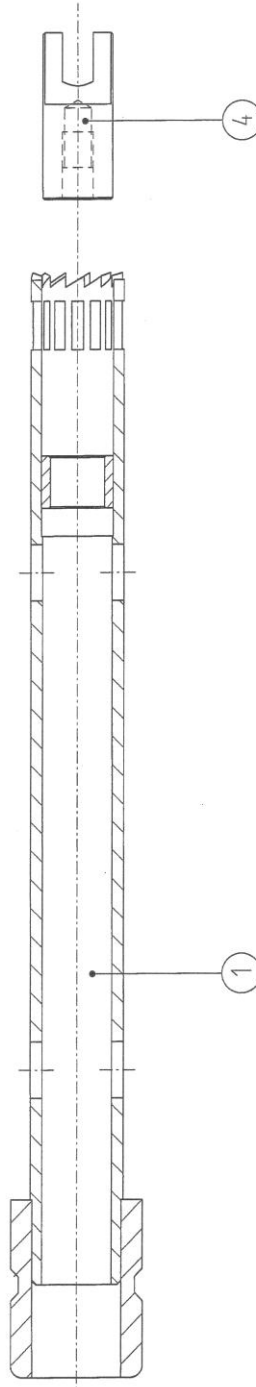
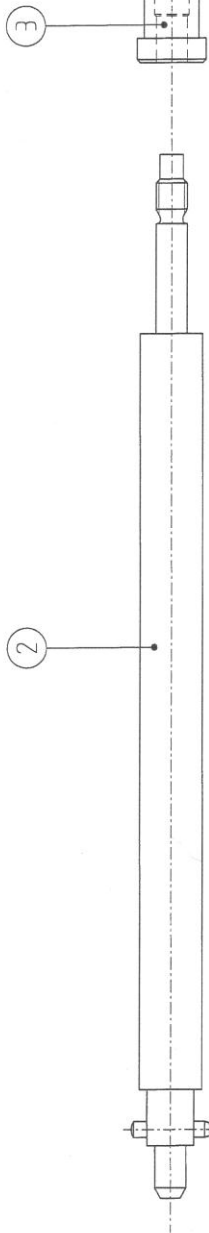
Allgemeine Toleranzen SN Z58440-m Alle Kanülen einbruchfest




| | | | | | | |
|---|------------|------|--|-----------------|------------|--------------|
| Sik | Gegenstand | Pos. | Material | Modell/Zch.-Nr. | Klient-Nr. | |
| Anwendungen | | | Microverfoll Datum | Klient-Nr. | | |
| | | | | Ersetzt für | | |
| | | | | Ersetzt durch | | |
| | | | | Gezeichnet | 17.10.1997 | RO |
| PT-DA 1307/2EC | | | Massstab 2:1 | Geprüft | 20.10.1997 | BT |
| | | | | Freigebe | 20.10.1997 | BT |
|  | | | PT 1300 | | | |
| | | | KINEMATICA AG Degerlee- und Mischtechnik Luzernerstr. 147a CH-6014 Hilti/Leuzen | | | |
| | | | Index | | | Anzahl Bl. 1 |
| | | | BA 004-007-3 | | | Blatt No. 1 |



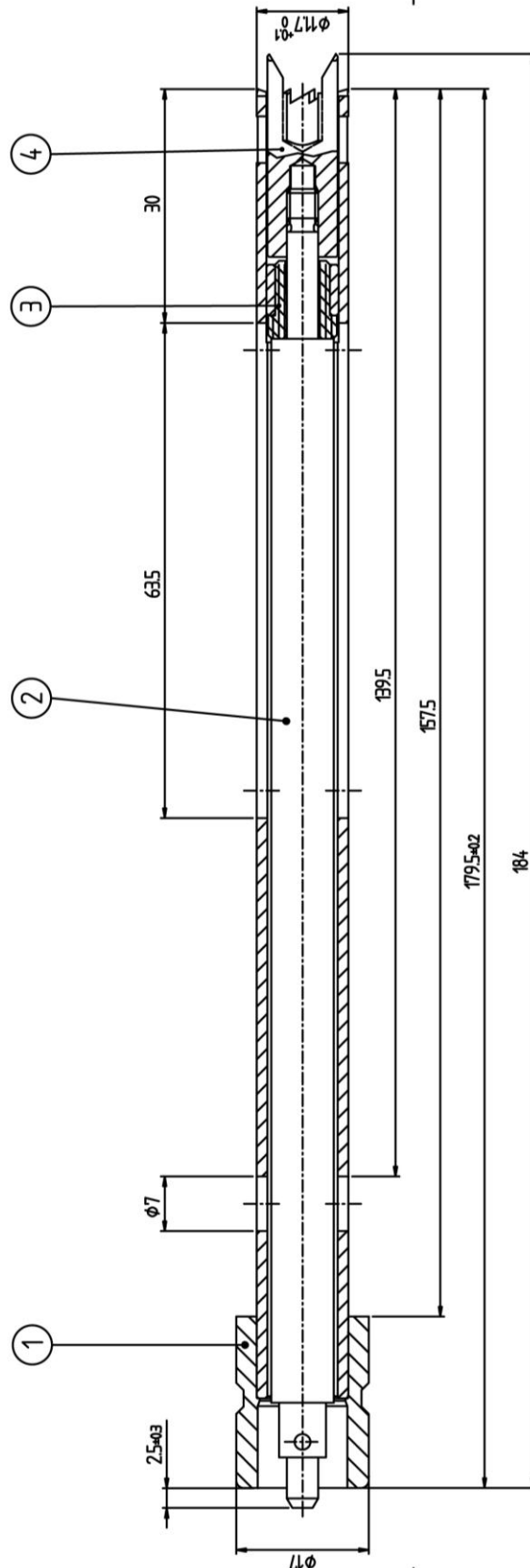
Diese Zeichnung ist unser geistiges Eigentum und darf ohne unsere Einwilligung weder kopiert, vervielfältigt, weitergegeben, noch zur Ausführung benutzt werden.
Allgemein Toleranzen DIN 25460-m. Alle Kanten glänzen.




| Stk. | Aenderungen | Gegenstand | Pos. | Material | Modell/Zch.-Nr. | | Ident.-Nr. | | | |
|---|-------------|------------|------|-----------------------|-----------------|----------------|------------|--|--|--|
| | | | | | Ident.-Nr. | Erstellt für | | | | |
| PT-DA 1312/2EC | | | | Microverfilm Datum | Erstellt durch | Erstellt durch | R0 | | | |
| | | | | Massstab 2:1 | Gezeichnet | Gezeichnet | | | | |
| | | | | PT 1300 | Geprüft | Geprüft | | | | |
| | | | | | Freigegeben | Freigegeben | | | | |
|  KINEMATICA AG Dispersier- und Mischtechnik CH-6014 Ullsau/Luzern | | | | BA.004-003-3 | | | Index | | | |
| | | | | | | | | | | |
| | | | | | | | Anzahl Bl. | | | |
| | | | | | | | Blatt Nr. | | | |
| | | | | | | | 1 | | | |
| | | | | | | | 1 | | | |



Diese Zeichnung ist unser geistiges Eigentum und darf ohne unsere Erlaubnis weder kopiert, vervielfältigt, weitergegeben, noch zur Ausführung benutzt werden.
Allgemein Toleranzen DIN 25440-10 / Alle Kanten glänzen

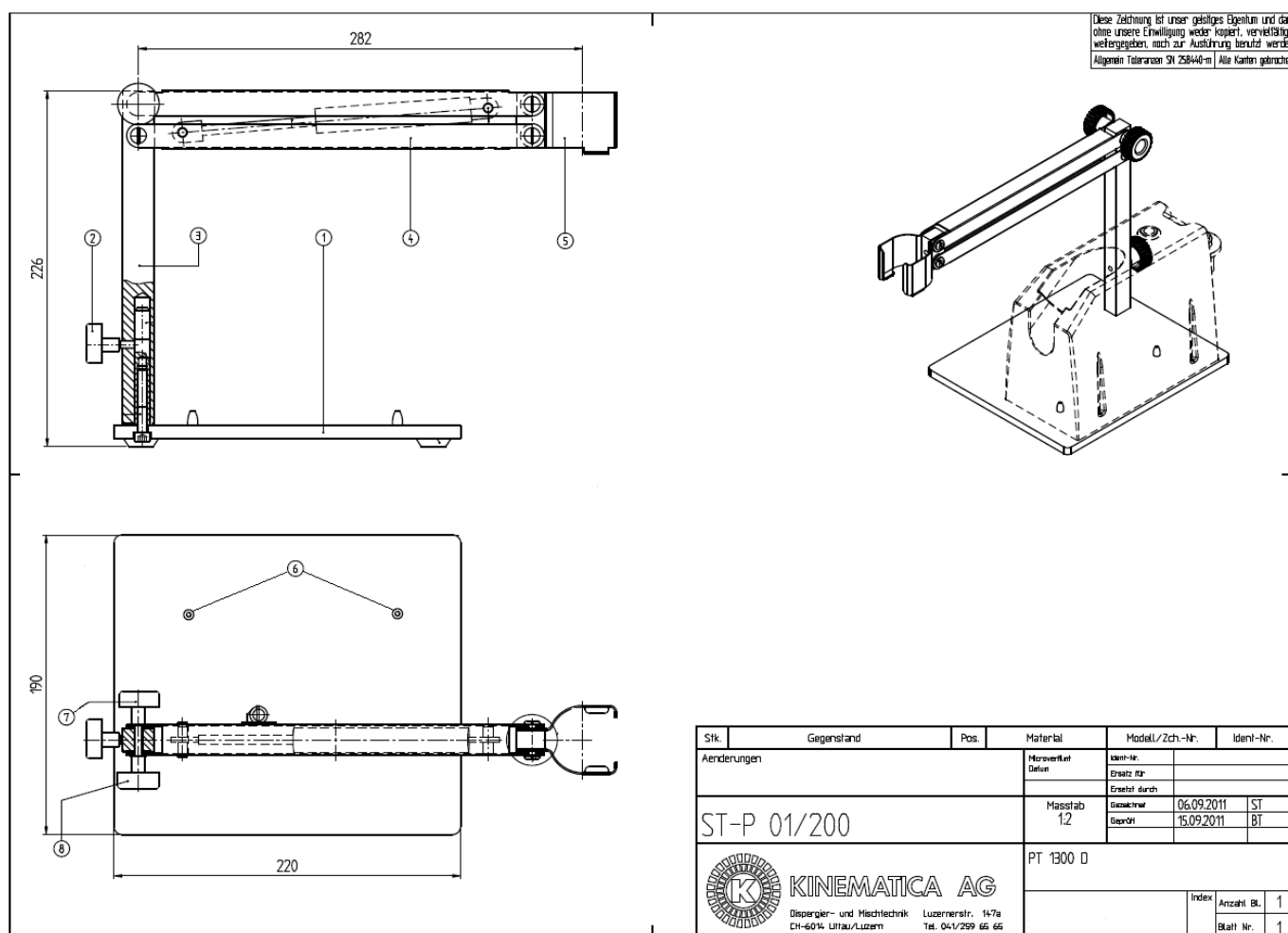


Rotor Pos.4 nur von Hand festziehen

| Stk. | Gegenstand | Pos. | Material | Modell/Zch.-Nr. | Ident.-Nr. |
|--|------------|------|---------------|-----------------|------------|
| Anderungen | | | Material | Ident.-Nr. | |
| A) Diverse Masse ergänzt: 24.10.06 AC | | | Erweit. für | | |
| | | | Erweit. durch | | |
| | | | Geschweis | 25.09.2006 | AC |
| | | | Signiert | 24.10.2006 | NY |
| | | | Freigegeben | 24.10.2006 | NY |
| PT-DA 1612/2 Z MEC | | | | | |
|  KINEMATICA AG Dispersier- und Mischtechnik Luzernerstr. 147a CH-6004 Littau/Luzern Tel. 041/250 12 57 | | | | | |
| 1.012-0195-3 | | | | | Index |
| | | | | | Anzahl Bl. |
| | | | | | Blatt Nr. |
| | | | | | 1 |
| | | | | | 1 |

10.2 LEGEND FOR THE STAND ST-P01/200

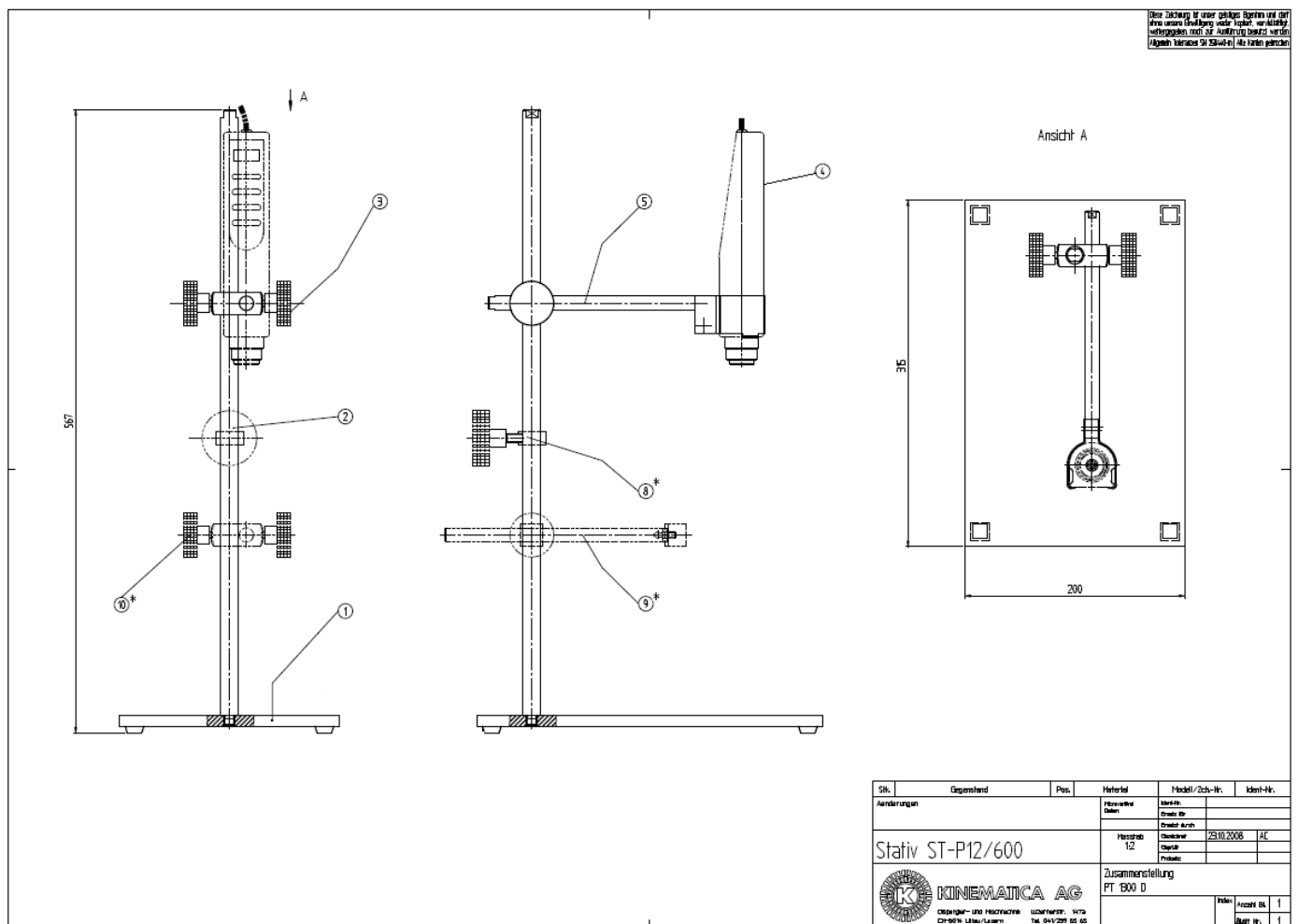
1. Base plate
2. Mounting screw
3. swivel arm
4. arm
5. Handheld holder
6. Base Station centering
7. Arm Fixation
8. Arm Fixation





10.3 LEGEND FOR THE STAND ST-P12/600

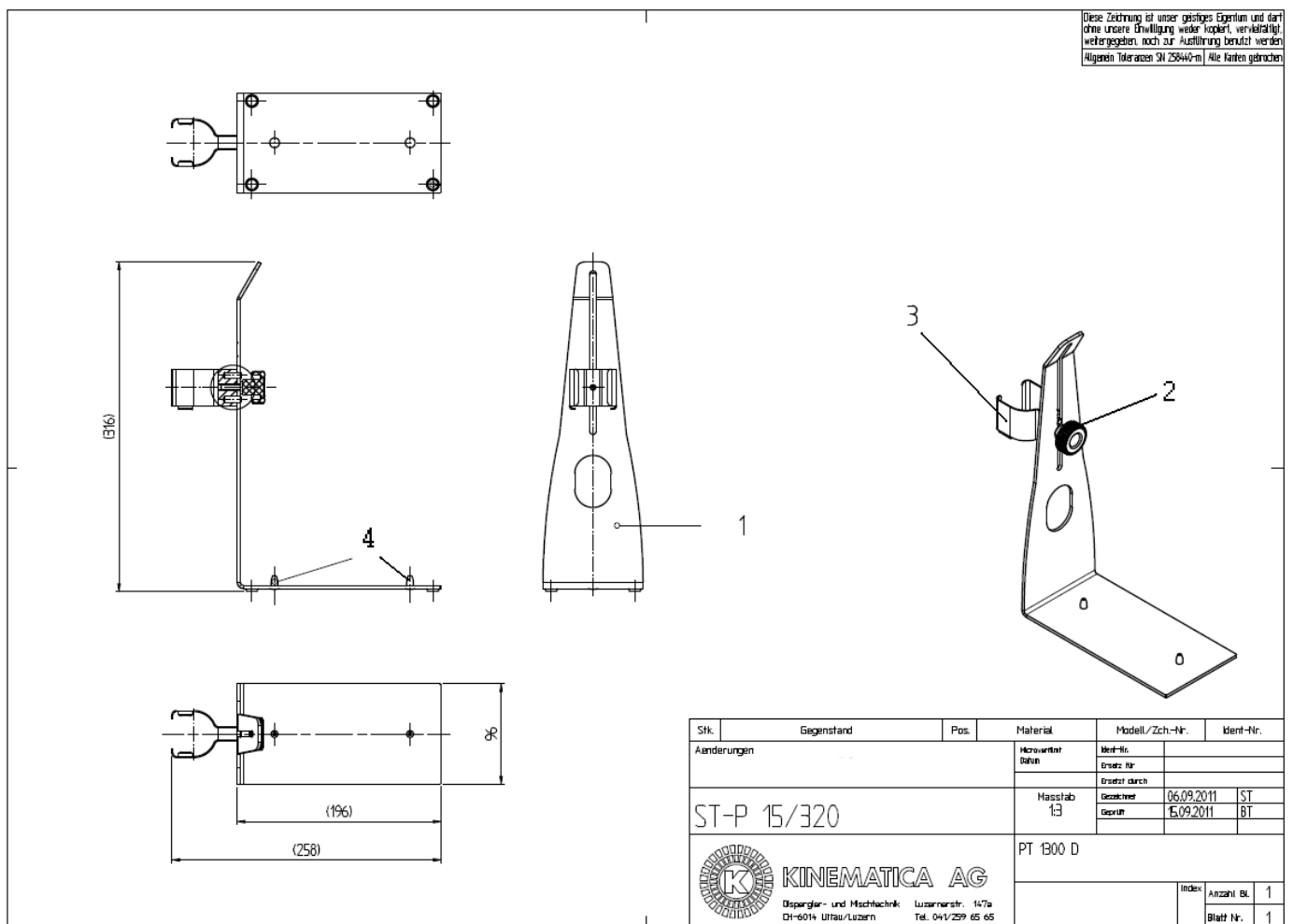
1. Base plate
2. Column
3. Cross sleeve completely
4. Handheld
5. Drive holder complete
6. -
7. -
8. adjustment ring (as an Option)
9. Vessel holder complete (as an Option)
10. Cross sleeve completely (as an Option)





10.4 LEGEND FOR THE STAND ST-P15/320

1. Stand plate
2. Fixation screw
3. Drive holder
4. Base Station centering





11 APPENDIX

This chapter regards only units with MODBUS Protocol respectively units with following item number

| Item number | Description |
|-------------|---------------------------------------|
| 11010030 | PT 1300 D MODBUS (with CH-Connector) |
| 11010031 | PT 1300 D MODBUS (with EU- Connector) |
| 11010039 | PT 1300 D MODBUS (with UK- Connector) |

11.1 IMPLEMENTATION

11.1.1 SLAVE-ADDRESS

The PT1300D has the fix address 0x01. The Broadcast-Address (0x00) is supported to, but only with the command 0x06, as by the Broadcast-Addressing only no replay acceptable is.

11.1.2 READ HOLDING REGISTER

More than one Register can be read out with one instruction code. Um mit dem PT3100D-Programm kompatibel zu sein, wurde die Abfrage von mehreren Registern mit einer Abfrage implementiert.

| Instruction code | Registeraddress | Remarks |
|------------------|-----------------|--|
| 0x03 | 0..15 | only Register 0..10 busy, Rest are writing with 0x0000 |

11.1.3 WRITE SINGLE REGISTER

In the PT1300D is a write single register integrated.

| Instruction code | Registeraddress | Remarks |
|------------------|-----------------|---------|
| 0x06 | 0..2 | -- |



11.2 REGISTER MAPPING

The following mapping is integrated.

| Register | Registeraddress | R/W | Remarks |
|------------|-----------------|-----|---|
| StartCmd | 0 | R/W | Only value 1 allowed, Motor on |
| SetSpeed | 1 | R/W | Set rotation speed, range 10..300 [100rpm] |
| StopCmd | 2 | R/W | Only value 0 allowed, Motor off |
| ActSpeed | 3 | R | Actual speed, range 10..300 [100rpm] |
| ActTemp | 4 | R | Internal temperature [0.1°C] |
| ActCrt | 5 | R | Motor current [mA], average |
| DevState | 6 | R | see sheet |
| PowerIn | 7 | R | Input power [0.1 W] Current average x measured voltage |
| Torque | 8 | R | Torque [0.1 mNm] Based on the current value and the torque constant of 7.48mNm / A |
| PowerOut | 9 | R | Output power [0.1 W], torque x actual speed |
| SupplyVolt | 10 | R | Supply voltage [0.1V] |
| FWVersion | 11 | R | Firmware-Version 10000..32767 effective: 10100 |

11.3 DEVICE STATUS

For the Register Address 6 (DevState) to apply the following Bit-Definition:

| | | |
|-------------------|--------|---|
| DevStateBlocked | 0x0001 | Motor blocked, to reset the fault the unit must be set OFF. The unit must be restarted. |
| DevStateOverTemp | 0x0004 | Unit to hot (limit 70.0°C), to reset the fault the unit must be set OFF. The unit must be restarted. |
| DevStateNoRPM | 0x0008 | Hallsensor fault to reset the fault the unit must be set OFF. The unit must be restarted. |
| DevStateSupplyErr | 0x0020 | Supply voltage out of limit of 22.0 .. 27.5V, to reset the fault the unit must be set OFF. The unit must be restarted. |
| DevStateUnspecErr | 0x0040 | Reserve |
| DevStateRemote | 0x0080 | Unit is controlled via interface, keypad is inactive To reset, the unit must be set OFF. The unit must be restarted. |
| DevStateRunNormal | 0x0100 | Motor has actual speed |
| DevStateOverLoad | 0x0800 | Temporary overload, Motor has no set speed while the load is to high (margin: -500rpm) |



11.4 MODBUS EXCEPTIONS

- 1 Illegal Function, only 0x03 and 0x06 are legal functions, all other are illegal
- 2 Illegal Data Address, command 0x03 and Register-Address higher 15, command 0x06 and writing of a Register-Address higher 2
- 3 Illegal Data Value – does not exist on the PT1300D
Remark: if more than 8 Byte recieved, is this a invalid communication. The communication is ignored, without reply.
- 4 Occur the command 0x06, cause are illegal values, see register-definition

11.5 INTERFACE PARAMETER

Interface parameters:

9600 baud
8 Datenbit
2 Stopbit
kein Parity

The RTU-Transmission-Mode is implemented.

Other modes and Interface-Parameter are not supported.

Message from Master have a maximum lenght of 8 Byte, if not so the message is ignored.



11.6 PRECAUTIONS



NEVER RUNNING THE PT 1300 D UNATTENDED. IF THE CONNECTION TO THE PC IS INTERRUPTED THE UNIT CONTINUES TO WORK.



THE PLUG OF HANDHELD MAY NEVER BE STUCK OR BE INSERTED UNDER TENSION. BEFORE PLUGGING OR UNPLUGGING THE HANDHELD, ALWAYS SWITCH OFF THE MAIN SWITCH.



IN AUTOMATIC MODE NEVER HANDLE ON THE UNIT BECAUSE OF INJURY. AUTOMATIC OPERATION OF THE UNIT IS SHOWN ALTERNATE ON THE DISPLAY.



EXTERNAL INTERFERENCE CAN NEVER START-RUN AUTOMATICALLY THE MACHINE.